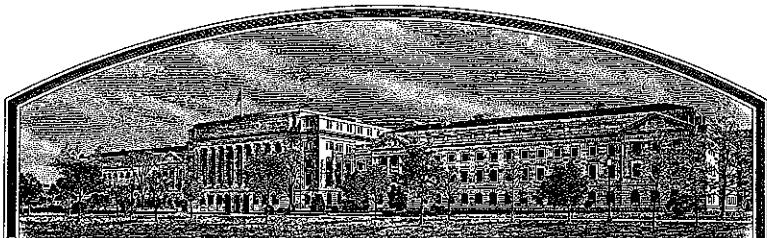


No.

200100259



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Progeny Advanced Genetics, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC FURNISHMENT OF Viable BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR SPLITTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE PURPOSES, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

LETTUCE

'Pacer'

In Testimony Whereof, I have hereunto set my hand
and caused the seal of the Plant Variety
Protection Office to be affixed at the City of
Washington, D.C. this twelfth day of December,
in the year two thousand and five.

Attest:

Commissioner

Plant Variety Protection Office
Agricultural Marketing Service

Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER

PROGENY ADVANCED GENETICS, INC.

4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)

**1536 B MOFFETT ST
SALINAS CA 93905-3342**

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME

PX584-W

3. VARIETY NAME

PACER

FOR OFFICIAL USE ONLY

PVPO NUMBER

200100259

FILING DATE

August 10, 01

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.)

CORPORATION

8. IF INCORPORATED, GIVE STATE OF INCORPORATION

CALIFORNIA

9. DATE OF INCORPORATION

12/26/94

FILING AND EXAMINATION FEES:

\$ 2705 -DATE **August 10, 01**

CERTIFICATION FEE:

\$ 682 -DATE **Nov. 29, 05**

FEES RECEIVED

11. TELEPHONE (Include area code)

831-751-6030

12. FAX (Include area code)

831-751-6032

13. E-MAIL

DMAN@IPROGENY.COM

14. CROP KIND (Common Name)

LETTUCE

15. GENUS AND SPECIES NAME OF CROP

LACTUCA SATIVA

16. FAMILY NAME (Botanical)

COMPOSITAE

17. IS THE VARIETY A FIRST GENERATION HYBRID?

 YES NO

18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)

19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act

 YES (If "yes", answer items 20 and 21 below) NO (If "no", go to item 22)

- Exhibit A. Origin and Breeding History of the Variety
- Exhibit B. Statement of Distinctness
- Exhibit C. Objective Description of Variety
- Exhibit D. Additional Description of the Variety (Optional)
- Exhibit E. Statement of the Basis of the Owner's Ownership
- Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)
- Filing and Examination Fee (\$2,705), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? YES NOIF YES, WHICH CLASSES? FOUNDATION REGISTERED CERTIFIED21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? YES NOIF YES, SPECIFY THE FOUNDATION REGISTERED CERTIFIED NUMBER 1,2,3, etc.

(If additional explanation is necessary, please use the space indicated on the reverse.)

22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?

 YES **AUG 14, 2000** NO

IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)

23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)?

 YES NO

IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)

24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER

NAME (Please print or type)

DARRYN GIBSON

SIGNATURE OF OWNER

NAME (Please print or type)

CAPACITY OR TITLE

MANAGER OF RESEARCH AND DEVELOPMENT

DATE

8/6/01

CAPACITY OR TITLE

DATE



200100259

Exhibit A Revised

Details of the Development of the Variety Pacer

Pacer is an iceberg lettuce variety developed from a hand pollinated cross of PAG 02-23, and Desert Queen made in 1994 in the San Joaquin Valley, California. PAG 02-23 is a white seeded selection from the commercial variety Raider. Both Raider and Desert Queen are heat tolerant iceberg types of lettuce available from Genecorp Seeds. Desert Queen, an Empire type was selected for its size, tip burn and bolting resistance, and Raider a Vanguard type was selected for its heat tolerance, texture and type. The cross was made and by the breeding method of pedigree selection we developed a heat tolerant Vanguard type iceberg lettuce variety designed for the early fall plantings in Huron California, a slot that is typically dominated by Empire type varieties.

Approximately 40 plants of the F1 seed were planted in a San Joaquin Valley production field for increase in 1995. The block was rogued, eliminating the self pollinating plants. The F2 seed was harvested in August of 1995.

Forty plants from the F2 seed were grown out in 1996 in a San Joaquin Valley, California research seed production field. Multiple individual plant selections were made at the market stage, selecting slow bolting Vanguard type plants with large head and frame. These plants were harvested individually producing the F3 seed in the fall of 1996.

The F3 seed lines were extensively trialed throughout 1996 and 1997 growing seasons in Yuma, Arizona and Huron, California. A selected line was increased in 1997 in a San Joaquin Valley, California research production field. Large heading, slow bolting Vanguard type plants were individually selected and harvested. The remainder of the block was intensely rogued for uniformity in type, size and maturity until harvest. These remaining plants were bulk harvested producing F4 trial seed in the fall of 1997. The F4 seed lines were evaluated in research and development plot trials in Huron California during 1998, where further selections were made for type and performance.

200100259

These selections were dug from the trial and grown to seed in our San Martin green house facility.

After demonstrating good uniformity and performance in the research plots, larger strip trials of the F4 trial seed were conducted in 1999 growing season in Huron, California, where it demonstrated good uniformity and stability. Seed from a single F4 plant selection was increased in 1999 in a San Joaquin Valley, California research production field and selectively rogued for uniformity of type, size and maturity. The variety was noted to demonstrate good uniformity, the desired vanguard type, and good heat tolerance . The F5 seed was harvested in the fall of 1999.

The F5 seed demonstrated excellent uniformity and stability and was free of variants when evaluated in trials in the fall of 2000 in Huron California. This variety exhibited excellent heat tolerance in terms of its slow bolting and tolerance to tip burn. In May of 2000, the F5 seed was increased in our San Joaquin Valley commercial seed production block. The variety was stable and uniform, and the F6 seed was harvested in early September.

Grow out trials of the F6 seed planted in late December of 2000 in Yuma Arizona showed the variety to be true to type, uniform, stable, and free of variants. Pacer as evaluated in commercial trials and seed production has been uniform and stable for two generation.

Seed from the variety Pacer was first sold on August 14, 2000 to a California based grower. At no point prior was any harvested material from the variety sold or offered for sale.

Exhibit B Revision

Statement of Distinctness

Pacer is a distinct variety of iceberg lettuce due to its type and adaptability. Pacer is a vanguard type variety that is a sure heading and large framed with excellent tolerance to heat. Pacer performs excellent during earliest fall plantings in the lettuce production region of Huron California, typically limited to empire type varieties.

Pacer is very distinct from its seed bearing parent Desert Queen. Where as Desert Queen is a large heading empire type, Pacer has a much less frilled leaf margin and is a distinct vanguard type of iceberg lettuce. The varieties are similar in size and color, but Pacer also demonstrates improved texture, and improved heading characteristics typical of vanguard type varieties.

Color of Pacer: **5GY5/8**

Additional Distinctions comparing Pacer and Desert Queen as reported in their respective Exhibit C Documentation.

Trait	Pacer	Desert Queen
Seed Color:	White	Black
Mature leaf indentation:	Crenate	Entire
Margin undulation:	Moderate	Strong

Pacer most closely resembles the commercial variety Raider. Pacer is distinguished from the variety Raider by seed color, heat tolerance and size. Pacer is white seeded and has increased heat tolerance as indicated by measured core lengths and planting slots. Recommended planting dates for Pacer during the fall plantings in Huron begins on August 8th, Raider is planted nearly 2 weeks later, beginning on August 20th. Pacer demonstrates a more compact head and shorter core length as indicated from the trial results.

Additional Distinctions comparing Pacer and Raider as reported in their respective Exhibit C Documentation.

Trait	Pacer	Raider
Seed Color:	White	Black
Cotyledon shape:	Spatulate	Intermediate
Cotyledon leaf shape:	Elongated	Oval



Cotyledon leaf undulation:	Flat	Medium
Cotyledon leaf rolling:	Absent	Present
Cotyledon leaf cupping:	Uncupped	Slight
4th leaf reflexing	Lateral margin	None
Mature leaf indentation:	Crenate	Shallowly dentate
Leaf thickness:	Intermediate	Thick
Butt Shape:	Round	Flat

Pacer is distinct from the variety Legacy. Where as Pacer is a vanguard type lettuce variety developed for the early fall plantings of the San Joaquin valley lettuce production region, Legacy is a Salinas type iceberg lettuce variety adapted to the cooler winter and spring plantings of the Salinas valley. This difference in adaptability is a critical distinguishing attribute as the climatical differences between these regions and production times are significantly different and require varieties with a specific set of traits.

A lettuce variety capable of being successfully produced during the early August plantings in the San Joaquin valley must have extreme tolerance to heat, such as Pacer. This requires a variety to be very slow bolting and have good tolerance to tip burn. Salinas type iceberg varieties such as Legacy, characterized as 'early bolting', 'vigorous grower', and 'large head size under low temperatures' do not have the necessary heat tolerance to perform during this time period. Legacy planted between August 8th and August 27th in the San Joaquin valley bolts, gets severe tip burn, and forms open, puffy, and unmarketable heads. Conversely the adapted variety Pacer continually produces large solid heads, with a low core and free of tip burn.

Like wise, for a variety to be successful for spring harvest in the Salinas valley, the variety must be vigorous and able to make adequate marketable head size and weight under cold and wet conditions. Pacer planted in the Salinas valley for spring harvest produces unmarketable small heads, where as the adapted variety Legacy produces large marketable heads.

OBJECTIVE DESCRIPTION OF VARIETY
LETTUCE *Lactuca sativa*

NAME OF APPLICANT (S)

PROGENY ADVANCED GENETICS, INC.

ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code)

1536 B MOFFETT STREET
SALINAS CALIFORNIA 93905

FOR OFFICIAL USE ONLY

PVPO NUMBER

2001 00259

VARIETY NAME

Pacer

EXPERIMENTAL DESIGNATION

Place numbers in the boxes for the characters which best describe this variety. Measured data should be the mean of an appropriate number (at least 10) of spaced plants. Royal Horticultural Society or any recognized color standard may be used to determine plant colors.

The location of the test area is:

HURON, CALIFORNIA

Color System Used:

MUNSELL COLOR CHART FOR PLANT TISSUES

1. PLANT TYPE: (See list of suggested check varieties page 4.)

6

- 01-Cutting/Leaf
02-Butterhead
03-Bibb
04-Cos or Romaine

- 05-Great Lakes Group
06-Vanguard Group
07-Imperial Group
08-Eastern (Ithaca) Group

- 09-Stem
10-Latin
11-OTHER-

2. SEED:

1

COLOR

- 1-White (Silver Gray)
2-Black (Gray Brown)
3-Brown (Amber)

LIGHT DORMANCY

- 1-Light Required
2-Light Not Required

HEAT DORMANCY

- 1-Susceptible
2-Not Susceptible

3. COTYLEDON TO FOURTH LEAF STAGE: NOTE: Provide a color photograph or photocopy of the fourth leaf from 20 day old seedling grown under optimal conditions.

3

SHAPE OF COTYLEDONS:

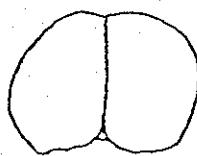
1-Broad

2-Intermediate

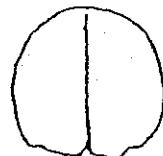
3-Spatulate

4

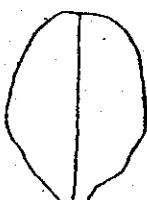
SHAPE OF FOURTH LEAF:



1



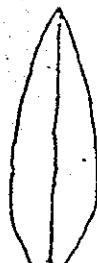
2



3



4



5



6

0

LENGTH/WIDTH INDEX OF FOURTH LEAF: L/W x 10

3

APICAL MARGIN:

1-Entire

4-Moderately Dentate

7-Lobed

4

BASAL MARGIN:

2-Crenate/Gnawed

5-Coarsely Dentate

8-OTHER (specify)

3-Finely Dentate

6-Incised

1

UNDULATION:

1-Flat

2-Slight

3-Medium

4-Marked

4

GREEN COLOR:

1-Yellow Green

3-Medium Green

5-Blue Green

7-Gray Green

2-Light Green

4-Dark Green

6-Silver Green

ANTHOCYANIN:

1

DISTRIBUTION:

1-Absent

3-Spotted

5-OTHER (specify)

2-Margin Only

4-Throughout

-

CONCENTRATION:

1-Light

2-Moderate

3-Intense

1

ROLLING:

1-Absent

2-Present

1

CUPPING:

1-Uncupped

2-Slight

3-Markedly

3

REFLEXING:

1-None

2-Apical Margin

3-Lateral Margins

200100259

4. MATURE LEAVES (observe harvest-mature outer leaves):

NOTE: Provide color photo of harvest-mature leaves which accurately shows color and margin characteristics.

MARGIN:

 2INCISION DEPTH:
(deepest penetration of the margin)

1-Absent/Shallow (Dark Green Boston)

2-Moderate (Vanguard)

3-Deep (Great Lakes 659)

 4INDENTATION:
(finest divisions of the margin)

1-Entire (Dark Green Boston)

2-Shallowly Dentate (Great Lakes 65)

3-Deeply Dentate (Great Lakes 659)

4-Crenate (Vanguard)

5-OTHER (specify)

 2UNDULATION OF THE
APICAL MARGIN:

1-Absent/Slight (Dark Green Boston)

2-Moderate (Vanguard)

3-Strong (Great Lakes 659)

 4

GREEN COLOR:

1-Very Light Green (Bibb)

2-Light Green (Minetta)

3-Medium Green (Great Lakes)

4-Dark Green (Vanguard)

5-Very Dark Green

6-OTHER

ANTHOCYANIN (grown at or below 10°C):

 1

DISTRIBUTION:

1-Absent

3-Spotted (Calif. Cream Butter)

2-Margin Only (Big Boston)

4-Throughout (Prize Head)

5-OTHER (specify)

 1

CONCENTRATION:

1-Light (Iceberg)

2-Moderate (Prize Head)

3-Intense (Ruby)

 2

SIZE:

1-Small

2-Medium

3-Large

 2

GLOSSINESS:

1-Dull (Vanguard)

2-Moderate (Salinas)

3-Glossy (Great Lakes)

 2

BLISTERING:

1-Absent/Slight (Salinas)

2-Moderate (Vanguard)

3-Strong (Prize Head)

 2

LEAF THICKNESS:

1-Thin

2-Intermediate

3-Thick

 1

TRICHOMES:

1-Absent (smooth)

2-Present (spiny)

5. PLANT (at market stage. Choose a comparison variety appropriate for this type.):

 4 8

SPREAD OF FRAME LEAVES:

cm This Variety

 4 6 cm DESERT QUEEN

(specify comparison variety)

 1 6

HEAD DIAMETER (market trimmed with single cap leaf):

cm This Variety

 1 7 cm DESERT QUEEN

(specify comparison variety)

 3

HEAD SHAPE:

1-Flattened

2-Slightly Flattened

3-Spherical

4-Elongate

5-Non-Heading

6-OTHER

 2

HEAD SIZE CLASS:

1-Small

2-Medium

3-Large

 2 4

HEAD COUNT PER CARTON

 7 5 6

HEAD WEIGHT:

g This Variety

 9 0 6 g DESERT QUEEN

(specify comparison variety)

 3

HEAD FIRMNESS:

1-Loose

2-Moderate

3-Firm

4-Very Firm

6. BUTT (bottom of market-trimmed head):

 3

SHAPE:

1-Slightly Concave

2-Flat

3-Rounded

 2

MIDRIB:

1-Flattened (Salinas)

2-Moderately Raised

3-Prominently Raised (Great Lakes 659)

7. CORE (stem of market-trimmed head):

 3 4

mm Diameter at base of head

 4 7

Ratio of head diameter/core diameter

 4 7

Core height from base of head to apex

mm This Variety

 4 2 mm DESERT QUEEN

(specify comparison variety)

8. BOLTING (Glue First Water Date MAY 11):

NOTE: First Water Date is the date seed first receives adequate moisture to germinate. This can and often does equal the planting date.

Number of days from First Water Date to seed stalk emergence (summer conditions):

This Variety

 7 2

DESERT QUEEN

(specify comparison variety)

 2

BOLTING CLASS:

1-Very Slow

2-Slow

3-Medium

4-Rapid

5-Very Rapid

Height of mature seed stalk:

cm This Variety

 8 2 cm DESERT QUEEN

(specify comparison variety)

200100259

39	Spread of Bolter Plant (at widest point): cm. This Variety.	41 cm	DESERT QUEEN	(Specify comparison variety)
<input checked="" type="checkbox"/> 2	BOLTER LEAVES:	1-Straight	2-Curved	
<input checked="" type="checkbox"/> 2	MARGIN:	1=Entire	2=Dentate	
<input checked="" type="checkbox"/> 2	COLOR:	1-Light Green	2-Medium Green	3-Dark Green
BOLTER HABIT:				
<input checked="" type="checkbox"/> 2	TERMINAL INFLORESCENCE:	1-Absent	2-Present	
<input type="checkbox"/> 1	LATERAL SHOOTS: (above head)	1-Absent	2-Present	
<input type="checkbox"/> 1	BASAL SIDE SHOOTS:	1-Absent	2-Present	

9. MATURITY (earliness of harvest-mature head formation):

NOTE: Complete this section for at least one season.

SEASON	Applie. 1/ # of days	Check 1/ # of days	CHECK VARIETY 2/
Spring	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	NA
Summer	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	NA
Fall	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	DESERT QUEEN
Winter	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	NA

Give planting date(s), and location(s):

Spring NA

Summer NA

Fall AUGUST 8 Through August 27 Huron California Growing Region

Winter NA

1/ First water date to harvest.

2/ Fill in check variety name on the appropriate line.

10. ADAPTATION:

PRIMARY REGIONS OF ADAPTION (tested and proven adapted): (0=Not tested 1=Not Adapted 2=Adapted)

 1 Southwest (Calif., Ariz. desert) 1 West Coast 0 Northeast 0 Northcentral 0 Southeast 2 OTHER SAN Joaquin Valley 1 Spring (area _____) 2 Fall (area _____) Huron California 1 Summer (area _____) 1 Winter (area _____) 0 GREENHOUSE:

0=Not tested

1=Not Adapted

2=Adapted

 3 SOIL TYPE:

1-Mineral

2=Organic

3-Both

200100259

11. DISEASES AND STRESS REACTIONS (0=Not tested; 1=Susceptible; 2=Intermediate; 3=Resistant; 4=Highly resistant; 5=Tolerant)

VIRUS

- 1 Big Vein
- 1 Lettuce Mosaic
- 0 Cucumber Mosaic
- 0 Broad Bean Wilt
- 0 Turnip Mosaic
- 0 Beet Western Yellows
- 0 Lett. Infectious Yellows
- Other Virus _____

FUNGAL/BACTERIAL

- 1 Corky Root Rot (Pythium Root Rot)
- 1 Downy Mildew (Races _____)
- 1 Powdery Mildew
- 1 Sclerotinia Rot
- 0 Bacterial Soft Rot (Pseudomonas spp. & others)
- 0 Botrytis (Gray Mold)
- OTHER _____

INSECTS

- 0 Cabbage Loopers
- 1 Root Aphids
- 1 Green Peach Aphid
- Other Insect _____

PHYSIOLOGICAL/STRESS

- 5 Tipburn
- 5 Heat
- 0 Drought
- 1 Cold
- 0 Salt
- 5 Brown Rib (Rib Discoloration, Rib Blight)
- OTHER _____

POST HARVEST

- 5 Pink Rib
- 0 Russet Spotting
- 0 Rusty Brown Discoloration

- 0 Internal Rib Necrosis (Blackheart, Gray Rib, Gray Streak)
- 0 Brown Stain

12. BIOCHEMICAL OR ELECTROPHORETIC MARKERS:

13. COMMENTS:

SUGGESTED CHECK VARIETIES

- | <u>TYPE</u> |
|----------------------|
| 1) CUTTING/LEAF |
| 2) BUTTERHEAD |
| 3) BIBB |
| 4) COS. OR ROMAINE |
| 5) GREAT LAKES GROUP |
| 6) VANGUARD GROUP |
| 7) IMPERIAL GROUP |
| 8) EASTERN GROUP |
| 9) STEM |

CHECK VARIETY

- SALAD BOWL
- DARK GREEN BOSTON
- BIBB
- PARRIS ISLAND
- GREAT LAKES 659-700
- VANGUARD
- VIVA
- ITHACA

2001.00.259

PX 584-W



200100259



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advanced genetics®



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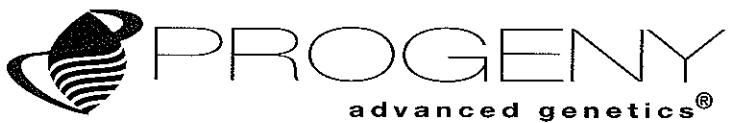


Exhibit D

Pacer is a distinct and novel variety of iceberg lettuce. Pacer is distinct as it is a Vanguard type, that exhibits increased heat tolerance, allowing it to be planted earlier in warmer climates than typical Vanguard types. This characteristic provides benefit to commercial lettuce growers as it possesses better leaf texture than typical Empire types.

200100259

Trial map #: PD90004
 Wet Date: 8/14/99
 Date eval: 10/12/99

PVP DATA:
 Comparison of Head Characteristics
 Location: Huron
 Grower: Royal Packing DCF

Ranch/lc 171-3

Maturity Date:
 Pacer 10/11/99
 Desert Queen 10/14/99

Commercial variety:

Desert Queen

Sample #	Core length (cm)	Core diam. (cm)	Head diam. (cm)	Head length (cm)	Avg Head Diameter (cm)	Avg Head Diam:Core Length	Frame diam (cm)	Head wt. (g)
	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen
1	5.1	5.0	3.6	14.7	15.0	14.6	14.7	49
2	7.2	5.9	3.8	17.5	14.5	15.8	16.0	832
3	5.5	5.0	3.5	15.4	18.5	14.3	13.6	916
4	6.4	4.2	3.8	15.4	18.2	16.0	15.7	674
5	5.2	5.0	3.5	15.9	14.6	15.6	13.0	888
6	6.4	4.9	3.5	15.9	16.4	15.2	13.2	922
7	5.5	5.6	3.2	16.9	17.9	13.6	15.3	806
8	4.5	3.3	3.0	16.6	17.4	14.0	15.2	45
9	4.9	3.3	3.5	15.8	16.2	14.8	15.3	736
10	5.4	5.4	3.5	14.6	17.0	14.0	13.0	602
11	4.2	4.6	3.5	16.1	15.4	13.8	14.8	854
12	4.6	4.2	3.2	16.5	15.9	14.8	13.2	646
13	4.9	5.5	3.5	18.6	16.6	14.8	15.1	890
14	5.2	4.2	3.5	15.0	17.4	14.9	14.6	752
15	4.5	4.9	3.4	18.2	17.6	14.6	13.5	746
16	7.5	5.6	3.6	18.0	17.2	14.2	13.8	598
17	5.3	5.9	3.3	15.6	15.8	14.8	15.7	880
18	4.2	4.2	3.5	16.6	15.9	15.0	14.6	840
19	6.1	4.2	3.5	16.9	18.6	15.2	15.5	666
20	7.4	3.2	3.0	15.6	15.2	15.6	16.0	712
21	6.2	5.6	3.0	17.9	18.9	15.8	16.1	838
22	5.5	6.1	3.4	16.2	17.9	15.1	14.5	916
23	6.0	4.2	3.0	17.2	17.1	14.4	13.0	598
24	6.2	4.8	3.5	15.9	17.0	15.0	15.5	684
Average	5.6	4.8	3.2	16.0	16.9	14.8	14.6	816
Stan dev	0.9523331	0.83716871	0.216632731	0.195603859	2.201515	1.185716624	0.620834	754
T test	3.38E-03	3.97E-05		8.59E-02	6.70E-01	2.33E-01	8.71E-04	1.58E-01
							6.20E-01	

Variety	Pacer	Desert Queen
Color	5825/8	5825/8
Tip	0/24	15/24

200100259

Trial map #: PD99007
 Wet Date: 8/27/99
 Date evald: 10/29/99
 Location: TresPicos
 Grower: T&A

PVP DATA:
 Comparison of Head Characteristics
 Ranch/LI-27-1

Maturity Date:
 Pacer 10/27/99
 Desert Queen 10/26/99

Commercial variety:
 Vandfall

Sample #	Cone length (cm)	Core diam. (cm)	Head diam. (cm)	Head length (cm)	Avg Head Diameter (cm)	Avg Head Diam/Core Length	Frame diam (cm)	Head wt. (g)
	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen
1	3.3	5.2	3.5	2.9	16.5	14.9	14.5	16.8
2	4.7	5.2	3.3	2.9	16.5	15.2	16.5	17.4
3	4.5	4.8	3.6	3.0	15.0	18.8	13.3	16.1
4	4.0	2.5	3.5	3.1	17.5	18.0	14.7	13.5
5	3.9	4.1	3.7	3.2	16.2	18.5	13.8	15.0
6	5.4	3.2	3.2	3.0	16.7	16.5	15.3	12.5
7	5.0	3.2	3.4	3.0	15.9	16.2	13.8	14.6
8	4.2	4.5	3.7	3.4	16.7	16.3	13.2	14.3
9	8.0	3.5	4.0	2.5	15.7	18.4	14.0	13.6
10	5.3	3.3	3.6	2.7	18.1	15.8	14.6	17.0
11	6.0	3.8	3.2	2.8	16.8	15.4	14.6	12.8
12	4.0	5.0	3.5	2.9	18.5	20.2	15.2	14.3
13	5.5	4.0	3.3	2.9	14.9	15.0	13.9	15.2
14	5.2	4.5	3.4	3.0	16.0	18.2	13.7	15.0
15	6.0	5.5	3.0	3.0	18.0	17.6	17.5	15.8
16	4.0	3.2	3.2	3.3	16.3	17.2	14.2	14.2
17	4.3	3.7	3.2	3.4	15.7	16.8	13.8	15.4
18	6.1	4.3	3.3	3.2	17.2	18.2	15.3	14.0
19	4.7	4.5	3.5	3.2	17.5	17.3	14.5	13.8
20	6.2	5.0	3.7	3.1	17.2	18.2	15.0	12.9
21	4.8	4.4	3.6	2.5	18.5	19.1	15.7	15.1
22	4.5	4.0	3.1	3.0	16.8	16.2	14.8	14.5
23	5.2	6.5	3.6	3.5	20.0	17.3	15.2	14.0
24	5.0	5.0	3.9	2.5	18.6	17.2	16.2	14.0
Average	5.9	4.3	3.5	3.0	17.0	17.6	14.9	14.3
Stan dev	1.0038693	0.905978533	0.250072453	0.280235701	1.227936	1.235671501	0.987751	0.957767634
T test	1.47E-02	5.48E-07	9.39E-02	6.00E-02	9.39E-01	6.00E-02	8.39E-01	1.05E-02

Variety	Pacer	Desert Queen
Color	5ey5/8	5ey6/6
Tip burn	8/24	21/24
Tip severity	1	2.5
Solidity	5	4.5

Solidity: 1=very loose

2=very solid

3=light

4=severe

5=severe

Trial map #: PD99008
 Wet Date: 9/1/99
 Date eval'd: 11/2/99

PVP DATA:
Comparison of Head Characteristics

Ranch/L: 16 4-3
 Location: Tres Picos
 Grower: T&A

Maturity Date:
 Light House
 Pacer
 Desert Queen
 11/5/99 65
 11/5/99 65

Sample #	Core length (cm)			Head diam. (cm)			Head length (cm)			Avg Head Diameter (cm)			Avg Head Diam:Core Length			Frame diam (cm)			Maturity Date:		
	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen	Pacer	Desert Queen	
1	5.0	3.5	3.5	2.9	14.8	16.0	15.2	15.0	15.6	3.0	4.5	5.0	48	634	683	48	634	683	48	634	
2	5.1	3.4	3.0	3.0	14.6	15.3	17.0	15.0	17.6	2.9	5.2	5.0	47	692	713	47	692	713	47	692	
3	3.2	3.8	2.6	3.0	16.8	18.4	12.6	13.7	14.7	16.1	4.6	4.2	47	675	660	47	675	660	47	675	
4	2.5	3.5	3.1	3.0	14.2	18.5	12.3	17.0	13.3	17.8	5.3	5.1	47	46	673	753	47	46	673	753	
5	3.8	4.3	3.6	2.8	17.2	17.2	13.3	15.6	15.3	16.4	4.0	4.7	47	43	651	915	47	43	651	915	
6	3.5	3.6	3.9	3.1	15.1	14.9	13.9	15.3	14.5	15.1	4.1	3.5	46	48	638	740	46	48	638	740	
7	3.5	3.5	3.7	3.1	13.5	17.0	13.7	15.0	13.6	16.0	3.9	4.4	51	44	684	715	44	44	684	715	
8	4.2	2.0	3.3	3.1	16.0	17.5	14.3	15.2	16.4	15.2	3.6	4.7	52	45	545	766	45	45	545	766	
9	3.5	2.5	3.3	2.8	15.2	17.2	14.9	13.5	15.1	15.4	4.3	7.7	48	46	69	874	46	46	69	874	
10	2.3	5.0	3.5	2.6	14.4	18.4	12.6	14.2	13.5	16.3	5.9	6.5	44	45	747	781	44	45	747	781	
11	3.3	4.3	3.0	2.9	14.5	17.5	14.0	16.0	14.3	16.8	4.3	3.4	53	47	646	846	47	47	646	846	
12	3.0	3.5	3.3	3.5	16.0	16.6	15.6	15.3	15.8	16.0	5.3	3.7	48	52	690	872	52	52	690	872	
13	4.0	3.2	3.3	3.2	14.7	16.8	14.8	14.4	14.8	15.6	3.7	4.5	50	51	702	893	51	51	702	893	
14	4.5	4.4	3.3	3.1	16.3	17.3	15.1	15.2	15.7	16.3	3.5	5.1	48	43	645	867	43	43	645	867	
15	3.2	5.2	3.1	3.0	13.4	16.7	16.2	16.8	14.8	16.8	4.6	3.8	50	47	645	715	47	47	645	715	
16	3.2	3.4	3.2	3.2	15.5	15.9	14.7	15.2	15.1	15.6	4.7	3.0	51	48	566	619	48	48	566	619	
17	3.0	4.1	3.2	2.9	15.5	17.5	17.2	16.0	16.4	16.8	5.5	4.1	49	49	766	810	49	49	766	810	
18	3.0	4.2	3.5	3.0	16.0	16.4	14.3	13.5	15.2	15.0	5.1	3.6	54	46	545	855	46	46	545	855	
19	4.8	2.8	3.3	3.2	16.5	16.5	14.9	14.8	15.5	15.9	3.2	5.7	53	44	668	858	44	44	668	858	
20	3.8	2.4	3.3	3.3	14.5	18.6	15.4	14.4	16.5	16.5	3.9	6.9	52	47	712	793	47	47	712	793	
21	3.9	3.8	3.0	3.3	13.5	17.0	15.2	12.9	14.4	14.9	3.7	3.9	48	52	619	891	52	52	619	891	
22	3.0	3.6	3.2	3.2	16.0	17.1	14.1	13.0	15.1	15.1	5.0	4.2	46	46	614	721	46	46	614	721	
23	4.4	2.0	3.3	3.2	16.8	15.6	14.2	13.2	15.5	14.4	3.5	7.2	47	49	698	796	49	49	698	796	
24	3.7	3.1	3.4	3.0	14.5	18.2	13.1	14.7	13.8	16.5	3.7	5.3	50	47	688	823	47	47	688	823	
Average	3.6	3.5	3.1	3.1	15.2	17.1	14.4	14.9	14.8	16.0	4.2	4.8	49.2	47.0	659.8	773.4	47.0	47.0	659.8	773.4	
Stand dev	0.7430353	0.826190402	0.2706657432	0.193181849	1.096439	0.957720346	1.168727	1.203708339	0.75335	0.823475205	0.80684409	1.245795449	2.53415	2.457980201	55.32061	102.155357	55.32061	55.32061	102.155357	102.155357	
T test	0.6746171	0.002548255	6.74E-08	6.74E-08	0.20784	5.33E-06	0.075092087	5.33E-06	0.075092087	0.075092087	0.003208	1.76E-05									

Variety	Pacer	Desert Queen
Color		
Tip bum	2/24	8/24
Tip severity	1	2
Solidity	3	3

Solidity: 1= very loose

5= Very solid

Tip Severity = light

5=severe

200100259

200100259

Trial map #: PD9004
Wet Date: 8/14/99
Date evald: 10/12/99

PvP DATA:
Comparison of Head Characteristics
Location: Huron
Grower: Royal Packing DCF
Ranch/o 171-3

Maturity Date:
Desert Queen 10/11/99
Pacer 10/10/99
Raider W

Commercial variety:

Sample #	Core length (cm)	Core diam. (cm)	Head diam. (cm)	Head length (cm)	Avg Head Diameter (cm)	Avg Head Diam/Core Length	Frame diam (cm)	Head w1 (g)
	Pacer	Raider W	Pacer	Raider W	Pacer	Raider W	Pacer	Raider W
1	5.1	5.5	3.6	3.1	14.7	15.5	14.8	15.2
2	7.2	3.6	3.0	17.5	14.5	14.5	14.4	49
3	5.5	5.5	3.3	15.4	14.8	14.3	14.5	49
4	6.4	4.2	3.8	15.4	17.1	16.0	14.6	2.6
5	5.2	5.2	3.5	15.9	14.2	15.6	15.7	2.5
6	6.4	4.0	3.5	15.9	14.9	15.2	15.6	3.8
7	5.5	6.5	3.2	16.5	16.5	13.6	12.5	3.4
8	4.5	7.4	3.3	16.6	15.2	14.0	15.1	4.1
9	4.9	4.4	3.5	15.8	16.1	14.8	16.2	1.1
10	5.4	9.6	3.5	14.6	14.9	14.0	14.2	2.2
11	4.2	3.5	3.3	16.1	14.9	14.2	15.0	2.6
12	4.6	6.6	3.2	16.5	16.0	14.8	15.7	3.6
13	4.9	6.5	3.5	18.6	15.5	14.8	15.1	1.5
14	5.2	5.5	3.0	15.4	15.5	14.9	14.5	1.5
15	5.2	4.5	3.5	18.2	15.5	14.6	14.0	1.5
16	7.5	8.3	3.6	6.8	15.9	14.2	15.0	10.5
17	5.3	7.4	3.3	15.6	14.9	14.8	13.6	15.2
18	4.2	6.6	3.5	16.6	14.9	15.0	13.9	15.8
19	6.1	3.8	3.5	16.9	15.0	15.2	13.5	16.1
20	7.4	10.2	3.0	16.6	14.2	15.6	13.5	16.1
21	6.2	6.2	3.0	17.9	14.9	15.8	13.4	16.9
22	5.5	5.8	3.4	16.2	14.1	14.9	14.2	15.6
23	6.0	7.6	3.0	17.2	13.8	14.4	13.5	15.8
24	6.2	8.2	3.5	15.9	14.9	15.0	13.2	15.5
Average	5.6	6.1	3.4	16.0	14.3	15.2	14.2	15.4
Sian dev	0.932333	1.8265702	0.216652731	0.159452866	2.201515	0.781291656	0.616618	0.87161932
T test	1.91E-01	4.97E-05		9.51E-02	4.97E-03	1.38E-02	4.39E-01	6.33E-01

Variety	Pacer	Raider W
Color	55%/8	55%/8
Tip	0/24	0/24

200100259

PVP DATA:

Comparison of Head Characteristics Ranch/L-27-2-1

Commercial variety:

Sample #	Core length (cm)		Core diam. (cm)		Head diam. (cm)		Head length (cm)		Avg Head Diameter (cm)		Frame diam:Core Length		Head wt. (g)	
	Pacer	Raider W/S	Pacer	Raider W/S	Pacer	Raider W/S	Pacer	Raider W/S	Pacer	Raider W/S	Pacer	Raider W/S	Pacer	Raider W/S
1	3.3	6.0	6.0	3.0	16.5	17.8	14.9	15.2	15.7	16.5	4.8	2.8	4.9	4.7
2	4.7	5.5	3.3	3.0	16.5	16.4	15.2	13.2	15.9	14.8	3.4	2.7	4.9	4.9
3	4.5	6.0	3.6	3.2	15.5	15.5	16.1	13.5	15.6	14.5	3.5	2.4	4.7	5.0
4	4.0	5.5	3.5	3.2	17.5	17.5	14.7	13.4	16.1	15.3	4.0	2.8	4.9	4.8
5	3.9	6.2	3.7	3.3	16.2	16.2	13.8	14.0	15.0	15.1	3.8	2.7	4.8	4.7
6	5.4	3.5	3.2	3.0	16.7	17.0	15.3	14.1	16.0	15.6	3.0	2.5	4.8	4.7
7	5.0	5.2	3.4	3.5	15.9	15.1	13.8	16.1	14.9	15.6	3.0	2.5	5.1	4.8
8	4.2	3.8	3.7	3.3	16.7	16.0	13.2	12.2	15.0	14.1	3.6	2.7	4.6	4.6
9	8.0	4.0	4.0	3.0	15.7	15.3	14.0	12.7	14.9	14.0	1.9	3.7	5.6	5.6
10	5.3	5.0	3.6	3.5	18.1	15.3	15.8	14.0	17.0	14.7	3.2	3.7	5.0	4.5
11	6.0	8.4	3.2	3.2	16.8	16.4	14.6	14.5	15.7	15.5	2.6	3.1	4.5	5.2
12	4.0	6.2	3.5	3.5	18.5	18.8	15.2	15.2	16.9	17.0	4.2	2.0	4.6	4.9
13	5.5	4.5	3.3	3.5	14.9	15.1	13.9	14.6	14.4	14.9	2.6	2.4	5.2	4.8
14	5.2	4.3	3.4	3.3	16.0	16.5	13.7	14.3	14.9	15.4	2.9	3.4	5.3	4.5
15	6.0	5.2	3.0	3.5	18.0	16.5	17.5	14.4	17.8	15.5	3.0	3.6	5.6	4.5
16	4.0	3.2	3.4	3.2	16.3	16.0	14.2	13.8	15.3	14.9	3.8	2.9	5.0	5.1
17	4.3	6.5	3.2	3.5	15.7	17.2	13.8	12.8	14.8	15.0	3.4	2.3	5.7	5.3
18	6.1	4.0	3.3	3.2	17.2	14.1	15.3	13.5	16.3	13.8	2.7	3.5	5.5	4.8
19	4.7	4.5	3.5	3.2	17.5	15.3	14.5	13.8	16.0	14.6	3.4	3.2	4.9	4.9
20	6.2	4.6	3.7	3.8	17.2	17.4	15.0	15.2	16.1	16.3	2.6	3.5	5.2	5.3
21	4.8	5.0	3.6	3.8	18.5	15.0	15.7	14.2	17.1	13.4	3.6	2.8	4.7	5.1
22	4.5	5.2	3.1	3.2	16.8	15.2	14.8	13.5	15.8	14.4	3.5	2.8	4.6	5.1
23	5.2	4.0	3.6	3.4	20.0	15.2	15.2	13.1	17.6	14.2	3.4	3.5	4.9	4.9
24	5.0	3.5	3.9	3.7	18.6	14.7	16.2	15.3	17.4	15.0	3.5	4.3	4.8	4.8
Average	5.0	5.0	3.6	3.3	17.0	16.1	14.9	14.0	15.9	15.0	3.3	4.3	5.0	4.8
Stan Dev	1.0038593	1.191242197	0.576203844	0.237590562	1.227936	1.115893091	0.987161	0.947728023	0.9659485	0.80594485	0.617192934	0.617192934	0.617192934	0.617192934
T test	1.00E+00	8.93E-02	1.08E-02	3.57E-03	1.31E-03	2.17E-01	7.49E-02	3.24E-01	2.449489743	1.01598	1.01598	1.01598	1.01598	1.01598

Variety	Pacer	Raider W/S
Color	5bx5/8	5bx5/8
Tip burn	8/24	13/24
Tip severity	1	2
Solidity	5	5
Solidity:		1= very loose

Solidity: 1= very loose

5=Very solid

Tip Severity 1 = light

200100259

Sample #	PVP DATA:			Comparison of Head Characteristics			Commercial variety:			Light House			Maturity Date:				
	Pacer	Raider W	Pacer	Raider W	Pacer	Raider W	Pacer	Raider W	Pacer	Raider W	Pacer	Raider W	Pacer	Raider W	Pacer	Raider W	
1	5.0	3.1	3.5	3.1	14.8	17.2	15.2	13.8	15.0	15.5	3.0	5.0	5.0	5.1	6.34	.595	
2	5.1	3.2	3.0	3.1	14.6	15.3	13.7	13.0	14.1	14.7	2.9	4.4	5.0	5.0	6.92	.646	
3	3.2	3.0	2.6	3.1	16.8	15.2	12.6	14.5	14.7	14.9	4.6	5.0	4.7	5.0	6.75	.447	
4	2.6	5.0	3.1	3.5	14.2	14.5	12.3	14.2	13.3	14.4	5.3	2.9	4.7	4.5	6.73	.680	
5	3.8	3.9	3.6	3.4	15.1	15.2	13.3	15.4	13.3	15.3	14.1	4.0	2.8	4.7	4.6	.651	.602
6	3.5	3.4	3.9	3.7	3.0	13.5	14.2	13.7	14.2	13.9	14.5	13.8	4.1	3.5	4.6	.638	.590
7	3.5	3.9	3.7	3.0	3.0	16.0	15.0	14.3	14.3	13.6	14.3	13.9	4.2	5.1	5.1	.684	.635
8	4.2	4.3	3.3	3.0	3.0	15.2	14.2	14.9	14.9	13.0	15.1	14.2	3.6	3.6	5.2	.545	.543
9	3.5	3.0	3.3	3.1	3.1	15.2	14.2	14.9	14.9	13.0	15.1	13.6	4.3	3.2	4.8	.47	.615
10	2.3	3.8	2.7	2.7	14.4	15.6	12.6	12.8	13.5	14.2	5.9	—	4.7	4.4	.48	.747	.666
11	3.3	3.5	3.0	3.1	14.5	15.7	14.0	14.2	14.3	15.0	4.3	4.3	3.9	5.3	.47	.646	.589
12	3.0	3.5	3.3	3.1	16.0	15.0	15.6	15.6	13.1	15.8	14.1	5.3	4.0	4.8	.47	.690	.441
13	4.0	3.6	3.3	3.5	14.7	14.2	14.8	14.8	14.1	14.8	14.2	3.7	4.0	5.0	.48	.702	.543
14	4.5	3.8	3.3	3.7	16.3	14.5	15.1	15.1	12.2	15.7	13.4	3.5	3.7	4.8	.49	.645	.598
15	3.2	3.9	3.1	3.0	13.4	16.2	16.2	14.4	14.8	15.3	4.6	4.0	5.0	.50	.645	.497	
16	3.2	3.6	3.0	3.0	15.5	16.1	14.7	13.0	15.1	14.6	4.7	5.7	5.1	.46	.566	.537	
17	3.0	5.0	3.2	3.2	15.5	15.0	17.2	14.3	16.4	14.7	5.5	2.9	4.9	.46	.766	.700	
18	3.0	5.5	3.5	3.4	16.0	15.6	14.3	15.4	15.2	15.5	5.1	2.8	5.4	.48	.545	.647	
19	4.8	2.5	3.3	3.3	16.5	14.9	14.5	14.2	15.5	14.6	3.2	5.8	5.3	.49	.668	.438	
20	3.8	3.8	3.0	3.1	14.5	15.3	15.4	15.4	13.3	14.4	14.4	3.9	3.8	5.2	.48	.712	.686
21	3.9	4.6	3.0	3.0	13.5	15.5	15.2	15.2	13.6	14.4	14.4	3.7	3.1	4.8	.48	.619	.542
22	3.0	4.5	3.2	3.2	16.0	15.2	14.1	13.2	15.1	14.2	5.0	3.2	4.6	.49	.614	.590	
23	4.4	3.1	3.3	3.0	16.8	13.2	14.2	12.5	15.5	12.9	3.5	4.1	4.7	.49	.698	.638	
24	3.7	3.6	3.4	3.3	14.5	15.5	13.1	14.5	13.8	15.0	3.7	4.2	5.0	.47	.688	.584	
Average	3.6	3.8	3.2	3.2	15.2	15.1	14.4	13.6	14.8	14.4	4.2	3.9	4.9	.48.1	.659.8	.585.4	
Stan Dev	0.7430353	0.7207956158	0.270667452	0.220629863	1.096429	0.810617943	1.168727	0.807561637	0.75335	0.632251412	0.80684409	0.765794635	2.5533415	1.62353613	55.32061	75.2499339	
T test	0.1693949	0.18539835	0.187944	0.687944	0.007132	0.025178	0.007132	0.011993809	0.025178	0.007132	0.086098	0.086098	0.00031	0.00031			

Variety	Pacer	Raider W
Color		
Tip burn	4/24	
Tip severity	1	1
Solidity	3	3

Solidity:
 1= very loose
 5= Very solid
 Tip Severity 1= light
 5=severe

200100259

Trial map #: RSV00051 Location: Tres Picos Ranch/Hgt: 354.4 Date evald: 11/3/00
 Wet Date: 8/28/00 Grower: T&A Eval by: nd/ac/dg

Sample #	Core length (cm)	Core diam. (cm)	Head diam. (cm)	Head length (cm)	Avg Head Diameter (cm)	Avg Head Diam:Core Length	Frame diam (cm)	Head wt. (g)
	Pacer	Raider W	Pacer	Raider W	Pacer	Raider W	Pacer	Raider W
1	35.0	44.0	36.0	154.0	165.0	162.0	139.0	158.0
2	36.0	65.0	39.0	32.0	162.0	160.0	136.0	152.0
3	44.0	47.0	39.0	36.0	162.0	155.0	147.0	149.5
4	42.0	57.0	39.0	35.0	167.0	184.0	165.0	154.5
5	52.0	42.0	35.0	35.0	155.0	172.0	161.0	164.0
6	52.0	42.0	37.0	36.0	159.0	155.0	154.0	154.5
7	30.0	42.0	39.0	37.0	155.0	174.0	143.0	149.0
8	36.0	47.0	37.0	35.0	160.0	161.0	158.0	162.0
9	50.0	38.0	40.0	40.0	164.0	161.0	156.0	159.0
10	46.0	33.0	40.0	32.0	180.0	135.0	175.0	141.0
11	39.0	42.0	42.0	39.0	175.0	156.0	152.0	151.0
12	42.0	52.0	39.0	40.0	182.0	161.0	150.0	149.0
13	30.0	40.0	37.0	36.0	171.0	155.0	149.0	173.0
14	36.0	47.0	38.0	37.0	162.0	160.0	157.0	159.5
15	42.0	45.0	39.0	34.0	161.0	145.0	160.0	133.0
16	42.0	40.0	42.0	41.0	162.0	157.0	149.0	159.5
17	46.0	42.0	35.0	39.0	156.0	156.0	152.0	154.0
18	33.0	45.0	37.0	37.0	159.0	174.0	162.0	155.0
19	45.0	46.0	39.0	38.0	184.0	162.0	152.0	155.0
20	48.0	35.0	40.0	36.0	179.0	172.0	169.0	174.0
21	49.0	50.0	41.0	40.0	194.0	199.0	179.0	155.0
22	30.0	66.0	37.0	35.0	158.0	150.0	149.0	162.0
23	56.0	45.0	40.0	40.0	185.0	146.0	181.0	153.5
24	47.0	47.0	46.0	39.0	179.0	170.0	188.0	161.0
Average	42.0	46.2	38.4	37.3	166.9	161.5	156.9	155.6
Stan Dev	7.5007246	8.6560159329	1.951866447	2.591793067	11.0426545	10.31672344	11.95394	9.06887839
T test	8.13E-02	9.61E-02	8.81E-02	8.81E-02	2.94E-01	1.08E-01	1.51E-02	2.93E-07
								4.30E-02

200100259

Trial map #: YM00013 Location: South Roll Ranch/lot: Yowell 18 Date eval'd: 11/29/00
 Wet Date: 9/11/00 Grower: 4 M Commercial V Lighthouse Eval by: dgvt

Sample #	Core length (cm)	Core diam. (cm)	Head diam. (cm)	Head length (cm)	Avg Head Diameter (cm)	Frame diam (cm)	Head wt (g)
	Pacer	Raider	Pacer	Raider	Pacer	Raider	Pacer
1	24.0	35.0	32.0	140.0	138.0	120.0	136.5
2	29.0	31.0	36.0	152.0	139.0	125.0	130.0
3	24.0	34.0	36.0	138.0	144.0	114.0	141.5
4	20.0	40.0	32.0	115.0	132.0	127.0	120.0
5	29.0	40.0	30.0	142.0	135.0	124.0	127.0
6	30.0	30.0	32.0	144.0	152.0	130.0	140.0
7	28.0	35.0	32.0	160.0	134.0	136.0	137.0
8	20.0	27.0	30.0	138.0	114.0	135.0	136.0
9	25.0	39.0	30.0	32.0	132.0	136.0	119.0
10	30.0	30.0	32.0	34.0	130.0	128.0	120.0
11	24.0	43.0	38.0	124.0	147.0	142.0	130.0
12	35.0	36.0	34.0	32.0	135.0	141.0	125.0
13	25.0	36.0	30.0	30.0	125.0	135.0	120.0
14	20.0	37.0	30.0	33.0	142.0	133.0	155.0
15	35.0	20.0	30.0	32.0	156.0	129.0	141.0
16	28.0	22.0	32.0	30.0	137.0	145.0	120.0
17	22.0	32.0	33.0	31.0	135.0	150.0	155.0
18	36.0	29.0	30.0	36.0	136.0	140.0	135.0
19	25.0	35.0	30.0	30.0	136.0	160.0	130.0
20	30.0	35.0	30.0	35.0	128.0	136.0	125.0
21	20.0	27.0	30.0	32.0	128.0	125.0	137.0
22	30.0	40.0	33.0	33.0	117.0	120.0	138.0
23	24.0	50.0	34.0	30.0	145.0	140.0	141.0
24	28.0	50.0	30.0	32.0	145.0	150.0	125.0
Average	26.7	34.7	32.0	32.9	136.7	137.1	134.9
Std Dev	4.7683665	7.351303739	2.265304309	2.212857684	10.95312807	10.45863846	10.62529
T test	5.03E-05	1.82E-01	8.83E-01	1.82E-01	6.87E-01	8.72E-01	2.66E-05

8.34E-05 2.66E-05 9.70E-01

200100259

Trial map #: NA Location: Winterhaven Ranch/flat: 16F
 Wet Date: 9/16/00 Grower: Huerta Commercial Lighthouse
 Date evad: 11/3/00 Date Mature: 12/2/00
 Eval by: dg/lit Pacer
 Raider 11/3/00

Sample #	Core length (cm)	Core diam. (cm)	Head diam. (cm)	Head length (cm)	Avg Head Diam:Core Length	Frame diam (cm)	Head wt (g)
	Pacer	Raider	Pacer	Raider	Pacer	Raider	Pacer
1	20.0	27.0	28.0	115.0	164.0	152.0	119.5
2	26.0	33.0	30.0	140.0	166.0	141.0	140.5
3	20.0	36.0	31.0	115.0	145.0	125.0	153.5
4	21.0	44.0	25.0	145.0	150.0	140.0	147.5
5	40.0	28.0	34.0	150.0	180.0	145.0	140.0
6	25.0	30.0	31.0	130.0	160.0	129.0	120.0
7	26.0	28.0	36.0	130.0	161.0	120.0	141.0
8	26.0	21.0	36.0	121.0	142.0	127.0	133.0
9	23.0	31.0	32.0	143.0	152.0	139.0	145.0
10	30.0	29.0	35.0	134.0	171.0	146.0	132.0
11	21.0	26.0	34.0	145.0	150.0	147.0	132.0
12	20.0	33.0	34.0	132.0	140.0	135.0	137.0
13	34.0	24.0	39.0	111.0	147.0	142.0	135.0
14	30.0	28.0	33.0	121.0	156.0	142.0	170.0
15	15.0	33.0	34.0	110.0	165.0	140.0	154.0
16	21.0	30.0	35.0	145.0	146.0	127.0	143.0
17	20.0	36.0	31.0	152.0	153.0	130.0	156.0
18	26.0	30.0	34.0	136.0	155.0	140.0	136.0
19	20.0	28.0	35.0	122.0	129.0	140.0	122.0
20	25.0	21.0	34.0	121.0	135.0	139.0	134.0
21	20.0	20.0	35.0	136.0	142.0	146.0	144.0
22	18.0	31.0	36.0	141.0	125.0	152.0	150.0
23	39.0	26.0	34.0	156.0	143.0	138.0	155.0
24	20.0	20.0	41.0	33.0	138.0	139.0	144.0
Average	24.4	28.6	33.2	33.5	133.8	136.7	139.8
Stan dev	6.3301384	5.492419018	2.89927522	3.050302907	12.92537107	13.28832985	9.028839
T test	1.77E-02	7.00E-01	5.07E-05	5.07E-05	3.11E-01	3.11E-01	1.86E-02

1.244625791 1.043244025 2.430184582 3.3032154 134.2983 1.92.664082 3.03E-02 3.03E-02

Q1

200100259

29
 Trial map #: NA Location: Yuma Valley Ranch/lot: NA Date event: 12/6/00
 Wet Date: 9/16/00 Grower: T&A Commercial V Raider Eval by: dgjt

Sample #	Core length (cm)	Core diam. (cm)	Head diam. (cm)	Head length (cm)	Avg Head Diameter (cm)	Avg Head Diam:Core Length	Frame diam (cm)	Pacer	Raider	Pacer	Raider	Pacer	Raider	Pacer	Raider	Head wt (g)	
	Pacer	Raider	Pacer	Raider	Pacer	Raider	Pacer	Pacer	Raider	Pacer	Raider	Pacer	Raider	Pacer	Raider	Pacer	
1	23.0	29.0	33.0	40.0	154.0	167.0	120.0	146.0	137.0	156.5	6.0	5.4	4.8	4.6	602	750	
2	15.0	32.0	39.0	39.0	136.0	160.0	134.0	149.0	135.0	154.0	9.0	4.8	4.8	4.9	742	915	
3	21.0	25.0	32.0	35.0	135.0	140.0	140.0	135.0	137.5	137.5	6.5	5.5	4.3	4.4	660	936	
4	20.0	20.0	31.0	35.0	152.0	146.0	136.0	122.0	144.0	134.0	7.2	4.0	4.5	4.9	540	655	
5	20.0	20.0	36.0	36.0	121.0	160.0	138.0	122.0	129.5	141.0	6.5	7.1	4.6	4.6	620	620	
6	18.0	32.0	32.0	36.0	130.0	141.0	122.0	140.0	126.0	140.5	7.0	7.0	4.2	5.2	744	517	
7	16.0	36.0	36.0	36.0	141.0	155.0	122.0	151.0	131.5	153.0	8.2	4.8	4.1	5.0	735	788	
8	16.0	26.0	33.0	40.0	121.0	134.0	127.0	121.0	124.0	124.0	7.8	3.5	4.1	4.6	800	871	
9	18.0	20.0	35.0	36.0	128.0	125.0	132.0	132.0	130.0	128.5	7.2	4.9	4.2	4.9	691	501	
10	17.0	21.0	33.0	37.0	125.0	141.0	121.0	128.0	123.0	134.5	7.2	6.7	4.2	5.2	583	1012	
11	24.0	25.0	36.0	36.0	140.0	142.0	121.0	146.0	130.5	134.0	5.4	6.4	4.4	4.8	715	1110	
12	30.0	27.0	35.0	38.0	141.0	140.0	140.0	151.0	140.5	145.5	4.7	5.8	4.5	4.9	591	773	
13	25.0	29.0	34.0	37.0	135.0	146.0	133.0	130.0	134.0	138.0	5.4	5.1	4.3	5.2	552	592	
14	19.0	44.0	34.0	41.0	134.0	158.0	118.0	151.0	124.5	154.5	6.6	5.3	4.6	4.5	713	917	
15	17.0	20.0	36.0	35.0	145.0	145.0	132.0	145.0	138.5	145.0	8.1	3.3	4.6	4.7	794	741	
16	24.0	27.0	32.0	36.0	128.0	130.0	121.0	141.0	123.5	135.5	5.1	6.8	4.4	4.8	591	795	
17	20.0	35.0	34.0	40.0	144.0	176.0	130.0	132.0	137.0	154.0	6.9	4.4	4.2	4.6	598	738	
18	18.0	30.0	35.0	48.0	136.0	154.0	127.0	135.0	131.5	144.5	7.3	4.8	4.7	4.4	744	797	
19	15.0	35.0	33.0	34.0	135.0	146.0	124.0	124.0	139.0	129.5	142.5	8.6	4.1	4.3	4.7	569	820
20	26.0	34.0	35.0	37.0	145.0	145.0	132.0	145.0	138.5	145.0	8.1	3.3	4.6	4.7	975	975	
21	20.0	26.0	32.0	33.0	151.0	152.0	140.0	125.0	145.5	138.5	7.3	5.3	4.4	4.6	557	708	
22	15.0	22.0	34.0	34.0	155.0	155.0	124.0	121.0	139.5	138.0	9.3	6.3	4.7	4.7	700	677	
23	22.0	35.0	32.0	36.0	145.0	146.0	144.0	142.0	144.5	144.0	6.6	4.1	5.0	4.5	677	862	
24	18.0	28.0	35.0	40.0	121.0	140.0	138.0	134.0	129.5	137.0	7.2	4.9	4.7	4.8	790	508	
Average	19.9	28.3	34.3	37.1	137.2	147.3	129.8	136.4	133.5	141.9	6.9	5.2	4.6	4.8	663.9	770.3	
Stand dev	3.8932774	6.28490245	1.799758438	3.398701607	12.9547009	7.792137	10.02090207	6.78630201	8.239178234	1.082101053	2.446159368	2.42570773	83.5783	161.4673656			
T test	1.26E-06	7.51E-04	4.19E-03	1.39E-02					3.39E-04		4.45E-06	8.11E-05		6.21E-03			

200100259

Trial map #: RSIV0051 Location: Tree Picos Ranch/lot: 35-4-4 Date eval'd: 11/3/00
 Wet Date: 8/28/00 Grower: T&A Commercial V Raider Eval by: nd/ac/dig.

Sample #	Core length (cm)	Core diam. (cm)	Head diam. (cm)	Head length (cm)	Avg Head Diameter (cm)	Avg Head Diam:Core Length	Frame diam (cm)	Head wt. (g)
	Pacer	Raider	Pacer	Raider	Pacer	Raider	Pacer	Raider
1	35.0	50.0	36.0	35.0	154.0	142.0	162.0	146.0
2	36.0	65.0	39.0	37.0	162.0	181.0	150.0	156.0
3	44.0	72.0	39.0	36.0	162.0	164.0	147.0	166.0
4	42.0	37.0	39.0	37.0	167.0	155.0	165.0	164.0
5	52.0	48.0	35.0	37.0	155.0	169.0	161.0	166.0
6	52.0	42.0	37.0	36.0	156.0	155.0	154.0	154.0
7	30.0	30.0	39.0	40.0	155.0	166.0	143.0	162.0
8	36.0	42.0	37.0	37.0	160.0	165.0	158.0	165.0
9	50.0	40.0	38.0	40.0	164.0	171.0	156.0	170.0
10	46.0	72.0	40.0	37.0	180.0	146.0	175.0	159.0
11	39.0	79.0	42.0	35.0	175.0	180.0	152.0	162.0
12	42.0	65.0	39.0	40.0	182.0	180.0	150.0	161.0
13	30.0	60.0	37.0	37.0	171.0	172.0	149.0	163.0
14	36.0	71.0	38.0	39.0	162.0	189.0	157.0	161.0
15	42.0	59.0	39.0	36.0	161.0	179.0	145.0	175.0
16	42.0	62.0	42.0	39.0	162.0	164.0	157.0	169.0
17	46.0	61.0	35.0	36.0	156.0	175.0	152.0	172.0
18	33.0	49.0	37.0	40.0	159.0	160.0	162.0	164.0
19	45.0	69.0	39.0	40.0	164.0	171.0	152.0	157.0
20	48.0	64.0	36.0	35.0	179.0	164.0	169.0	160.0
21	49.0	71.0	41.0	41.0	194.0	161.0	179.0	153.0
22	30.0	50.0	37.0	37.0	158.0	147.0	149.0	160.0
23	56.0	55.0	40.0	40.0	185.0	160.0	181.0	164.0
24	47.0	55.0	40.0	41.0	179.0	164.0	188.0	160.0
Average	42.0	57.0	37.8	38.4	166.9	165.8	165.9	164.5
Std Dev	7.5007246	12.88747285	1.951866442	2.01444621	11.0465445	11.76459932	11.95394	7.103275423
T test	1.12E-05	3.49E-01	7.53E-01	7.53E-01	1.30E-01	5.44E-01	2.37E-04	8.04E-02

Intellectual Property

Bolting Habit

Production Year: 2000 Date Eval: 8/24/00
 Block: 6 Eval By: dg
 Variety: Pacer Wet Date: 5/11/00

		Bolting Date	
Pacer	Raider W	Desert Queen	
		7/14/00	7/14/00
			7/22/00

Plant number	Height mature Seed Stalk		Width of Seed Head		Days to maturity	
	Pacer	Raider W	Desert Queen	Pacer	Raider W	
1	83	89	79	41	37	42
2	80	92	81	45	36	46
3	81	84	83	49	34	41
4	87	87	79	47	36	40
5	84	95	77	48	35	40
6	84	92	83	37	40	42
7	84	96	72	34	41	42
8	86	91	79	34	41	40
9	86	95	83	40	46	42
10	81	90	72	42	47	40
11	81	89	79	40	37	41
12	92	97	83	41	38	46
13	85	91	86	37	36	43
14	81	93	84	41	37	41
15	84	94	79	40	35	43
16	86	91	83	33	32	40
17	89	92	84	36	33	39
18	82	93	96	32	37	40
19	90	94	89	34	34	41
20	85	93	94	37	36	40
Average	84.55	91.9	82.25	39.4	37.4	41.45
Standard Dev	3.2359006	3.11025469	6.016424887	5.04089	3.91219	1.904979624
T-Test		1.24E-08	1.17E-01	1.83E-01	4.08E-04	

*T-Test compares Variety to: Pacer

Bolting Habit	
Lateral shoots b/wn head and seed stalk	y
Lateral shoots above seed head	n
Basal shoots	n

Seed Color	
Pacer white	Raider W black

Bolting Leaves	
Shape: Straight or curved	
Pacer c	Raider W c

Margin	
Smooth or Dentate	
Pacer dentate	Raider W dentate

Color	
Lt, Med, Dark	
Pacer medium	Raider W medium

Terminal Inflorescence	
Yes, No	
Pacer yes	Raider W no

200100259

Trialing Protocol for Intellectual Property Protection.

I. Set Up

1. Parental lines and competing varieties are identified.
2. Primary slots are identified.
3. Necessary accession lines are located and purchased/received from seed dealers or growers.
4. All varieties are assigned a number to maintain integrity, and anonymity.
5. Trials are set up in the Progeny warehouse with all necessary varieties. Variety arrangement for trial is diagramed.

II. Planting

1. Commercial plantings are located by contacting commercial growers during the planting slot recommended for the variety.
2. Field is located during commercial planting, and the necessary rows and area is marked off by a Progeny employee with proper training.
3. Varieties are planted according to diagram, in 100 ft. ranges.
4. All varieties are planted in same manner, to mimic the planting of the commercial variety as closely as possible.
5. A trial map is drawn diagramming the trial, the trial location in the field, and directions to the field.

III. Maintenance

1. All varieties are treated identically. The grower handles all watering, fertilization, and pest control, as if it was no different from the commercial field it is grown with.
2. Thinning of the trial is done by a crew contracted by the commercial grower.

IV. Evaluation

1. Evaluations are done as near to the time of the commercial harvest as possible by knowledgeable Progeny employees.
2. The evaluation is conducted "blindly". The evaluator(s) do not have the key to the trial at the time of evaluation.
3. 24 heads of each variety are evaluated.
 - a. The frame diameter of 24 random plants are measured to the nearest cm.
 - b. 24 mature heads of each variety are cut to the cap leaf.
 - c. The heads are carried to an adequate work station
 - d. The following measurements are then conducted and recorded:
 1. Each head is weighed to the nearest gram.
 2. The core diameter of each head is measured to the nearest mm.
 3. The heads are then sliced in to halves, discarding 1 half.
 4. The core lengths (from the cut stem to the core tip) are measured to the nearest mm.
 5. The head length (from the cut stem to the cap leaf) is measured to the nearest mm.
 6. The head diameter (at its widest point) is measured to the nearest mm.
 7. The ideal maturity or harvest date is then estimated based on the solidity of the head, the core length and any other physiological characteristics present.
 8. The leaf color is documented using the Munsell Color Charts for Plant Tissue.
 - e. From these measurements, we then use an Excell program to calculate the averages, the standard deviations and the T-Tests for the compared varieties.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)

PROGENY ADVANCED GENETICS, INC.

4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country)

**1536 B MOFFETT STREET
SALINAS CALIFORNIA 93905**

2. TEMPORARY DESIGNATION
OR EXPERIMENTAL NUMBER

PX584

3. VARIETY NAME

PACER

8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain.

YES NO

5. TELEPHONE (include area code)

831-751-6030

6. FAX (include area code)

831-751-6032

7. PVPO NUMBER

200100259

9. Is the applicant (individual or company) a U.S. national or U.S. based company?

If no, give name of country

YES NO

10. Is the applicant the original owner?

YES

NO

If no, please answer one of the following:

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

YES

NO

If no, give name of country

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

YES

NO

If no, give name of country

11. Additional explanation on ownership (if needed, use reverse for extra space):

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal opportunity employer.